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TECHNICAL REPORT NO. 67-39

DESIGNATION OF DATA RECORDED AT THE
TONTON FOREST SEISMOLOGICAL OBSERVATORY
1 May 1965 through 31 December 1966

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TECHNICAL REPORT NO. 67-39

DESIGNATION OF DATA RECORDED AT THE
TONTON FOREST SEISMOLOGICAL OBSERVATORY
1 May 1965 through 31 December 1966

Sponsored by

Advanced Research Projects Agency
Nuclear Test Detection Office
ARPA Order No. 624

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Wash. D. C.

GEOTECH
A Teledyne Company
3401 Shiloh Road
Garland, Texas

14 July 1967

IDENTIFICATION

| | |
|---------------------------|---|
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ABSTRACT

This report outlines the designators used to identify the seismic and meteorological data recorded at the Tonto Forest Seismological Observatory under Project VT/5055 during the period from 1 May 1965 to 31 December 1966.

DESIGNATION OF DATA RECORDED AT THE
TONGO FOREST SEISMOLOGICAL OBSERVATORY
1 May 1965 through 31 December 1966

1. INTRODUCTION

This is a report on the identification of the seismic and meteorological data formats recorded at the Tongo Forest Seismological Observatory (TFSO), under Project VT/5055. The designations used to identify the seismograms are listed and explained, the characteristic response of each seismograph is given, and the location of seismometers are shown. The designators for the meteorological data are also listed.

2. ACQUISITION OF SEISMIC AND
METEOROLOGICAL DATA AT TFSO

2.1 GENERAL

During the period from 1 May 1965 to 31 December 1966, data produced by more than 100 seismographs were recorded at the TFSO. Seismic signals were detected from a range of 0.01 cps to 6 cps and recorded on 16-millimeter film, 35-millimeter film, and magnetic tape.

The operating parameters and tolerances for the TFSO standard seismographs are shown in table 1. Normalized response characteristics of the standard seismographs, as they were being operated on 31 December 1966 are shown in figure 1. The frequency responses with which the long-period seismographs were operated earlier in the contract period are shown in figure 2.

In addition to the standard seismographs, two band-pass filtered summation seismographs (ΣTF and ΣTFK) were operated at the observatory. The filtered-summation seismograms were used as "diag" seismograms during the routine on-line analysis of data. The ΣTF seismograph employs a filter with a pass band from 0.7 to 1.75 cps. The ΣTFK filter employs a filter with a pass band from 1.0 to 3.0 cps. The high-cut and low-cut slopes of both filters is 24 dB/octave.

Table 1. Operating parameters and tolerances of standard seismographs at TFSO

| Seismograph | | | Operating parameters and tolerances | | | | | Filter settings | |
|-----------------|------|------------------|-------------------------------------|-----------|-------------|-------------|-------------|-----------------|---------------------------------|
| System | Comp | Type | Model | Ts | λs | Tσ | λg | δ ² | Cutoff rate at SP side (dB/oct) |
| SP | Z | Johnson-Matheson | 6480 | 1.25 ± 2% | 0.54 ± 5% | 0.33 ± 5% | 0.65 ± 5% | 0.0117 | 0.1 - 100 |
| SP | H | Johnson-Matheson | 7515 | 1.25 ± 2% | 0.54 ± 5% | 0.33 ± 5% | 0.65 ± 5% | 0.0117 | 0.1 - 100 |
| SP | Z | Benioff | 1051 | 1.0 ± 2% | 1.0 ± 5% | 0.2 ± 5% | 1.0 ± 5% | 0.0104 | 0.1 - 100 |
| SP | H | Benioff | 1101 | 1.0 ± 2% | 1.0 ± 5% | 0.2 ± 5% | 1.0 ± 5% | 0.0104 | 0.1 - 100 |
| SP | Z | UA Benioff | 1051 | 1.0 ± 2% | 1.0 ± 5% | 0.75 | 1.0 ± 5% | 0.0245 | 0.1 - 100 |
| SP | H | UA Benioff | 1101 | 1.0 ± 2% | 1.0 ± 5% | 0.75 | 1.0 ± 5% | 0.0245 | 0.1 - 100 |
| SP | H | Wood-Anderson | TS 220 | 0.8 | 0.78 | | | | |
| IB | Z | Melton | 10012 | 2.25 ± 5% | 0.65 ± 5% | 0.64 ± 5% | 1.2 ± 5% | 0.0006 | 0.05 - 100 |
| IB | H | Lehner-Griffith | SH-216 | 2.25 ± 5% | 0.65 ± 5% | 0.64 ± 5% | 1.2 ± 5% | 0.0004 | 0.05 - 100 |
| BB | Z | Press-Ewing | SV-232 | 12.0 ± 5% | 0.425 ± 10% | 0.64 ± 5% | 9.0 ± 10% | 0.00027 | 0.05 - 100 |
| BB | H | Press-Ewing | SH-242 | 12.0 ± 5% | 0.425 ± 10% | 0.64 ± 5% | 9.0 ± 10% | 0.00027 | 0.05 - 100 |
| Lp ^a | Z | Geotech | 7505A | 20.0 ± 5% | 0.74 ± 10% | 110.0 ± 10% | 0.83 ± 10% | 0.66 | 25 - 1000 |
| Lp ^a | H | Geotech | 8700C | 20.0 ± 5% | 0.74 ± 10% | 110.0 ± 10% | 0.83 ± 10% | 0.66 | 25 - 1000 ^c |
| Lp ^b | Z | Geotech | 7505A | 20.0 ± 5% | 0.74 ± 10% | 110.0 ± 10% | 0.83 ± 10% | - | 20 - 200 ^c |
| Lp ^b | H | Geotech | 8700C | 20.0 ± 5% | 0.620 ± 10% | 30.0 ± 10% | 0.591 ± 10% | - | 25 - 1000 |
| | | | | | | | | | 20 - 1000 ^c |

KEY

SP Short period
IB Intermediate band
BB Broad band
LP Long period
UA Unamplified (i.e., earth powered)

Ts Seismometer free period (sec)
Tg Galvanometer free period (sec)
λs Seismometer damping constant
λg Galvanometer damping constant
δ² Coupling coefficient

^aSince March 1966

^bPrior to March 1966

^cWith a 6-second notch filter

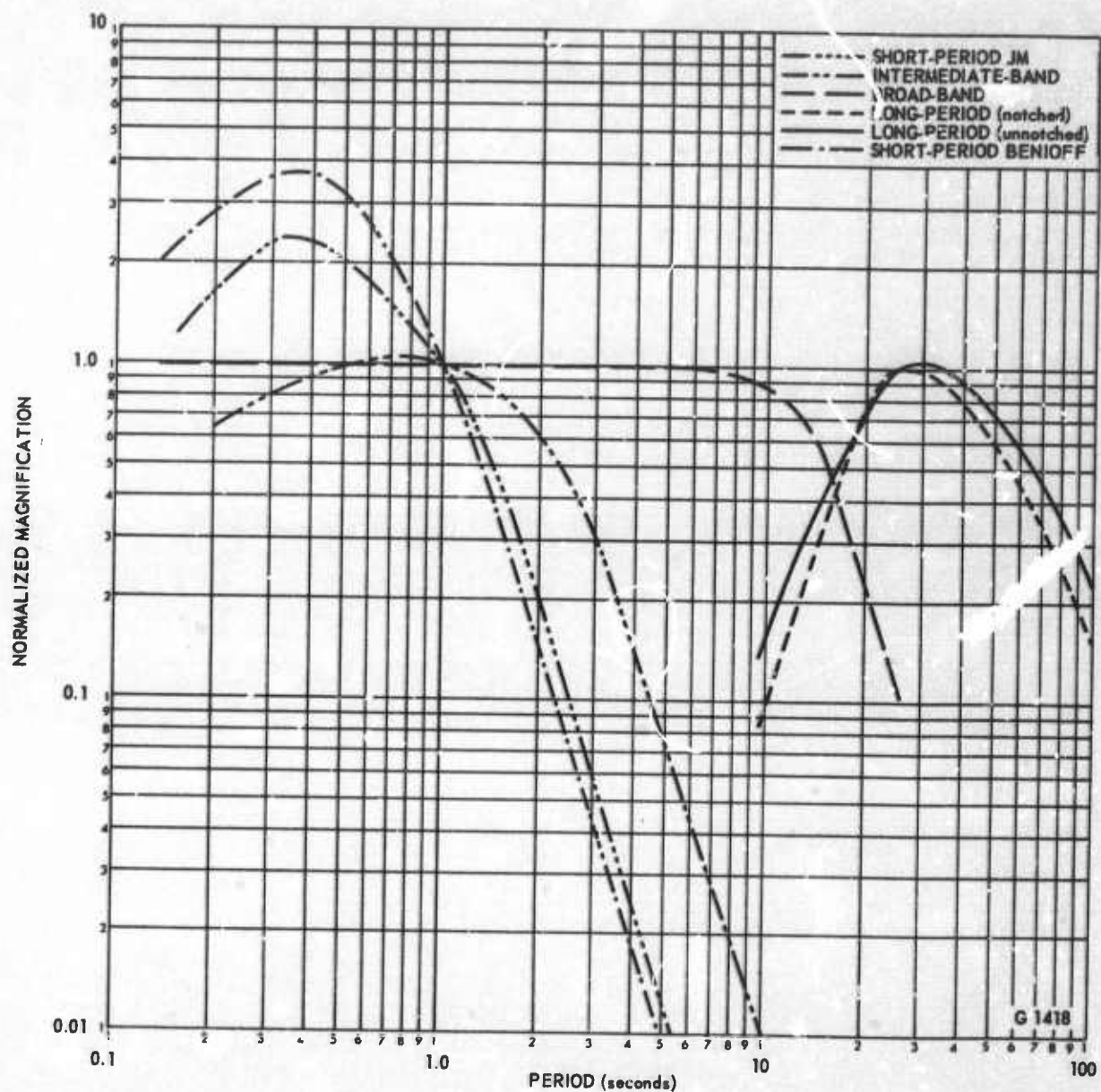


Figure 1. Normalized response characteristics of standard seismographs at TFSO

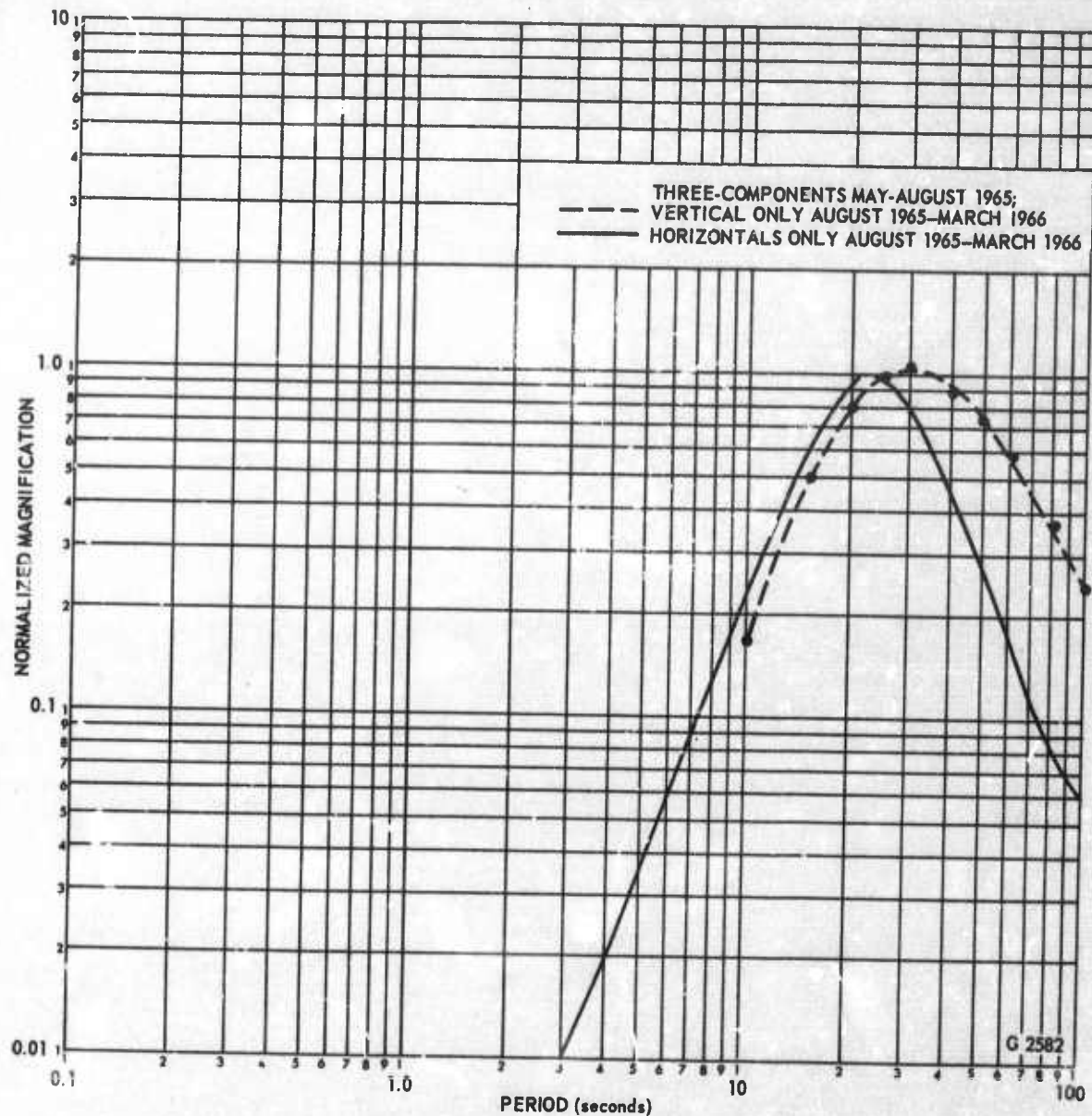


Figure 2. Normalized response characteristics of long-period seismographs at TFSO prior to March 1966

2.2 SEISMOMETER ARRAYS

The seismic data recorded at TFSO were produced by seismometers positioned to form four arrays; the crossed linear array, 31-element array, 19-element array, and the extended array. Seismometer locations which formed the 31-element and crossed linear arrays are shown in figure 3. The vault location numbers are also given in figure 3. Seismometer locations which formed the 19-element array are shown in figure 4.

The location of eight mobile seismic recording vans used to extend the legs of the crossed linear array between the beginning of Project VT/5055 and 3 October 1965 are shown in figure 5. The geographic location of TFSO is also given in the figure. Data from the extended array were transmitted to the TFSO central recording building (CRB) via telephone and VHF telemetry systems. All of the mobile sites were equipped with a 3-component short-period system and a 3-component long-period system. Seven-element short-period vertical arrays were also installed at the Winslow, Arizona (WO-AZ) and the Jerome, Arizona (JR-AZ) sites. Location of the seismometers which formed the WO-AZ and JR-AZ arrays are given in figures 6 and 7, respectively.

2.3 METEOROLOGICAL DATA

Meteorological data were recorded at TFSO. Wind velocity and barometric pressure data were recorded on 16-millimeter film.

3. DESIGNATION CODE

3.1 TFSO SHORT-PERIOD DATA DESIGNATORS

Two sets of designators were used to designate the short-period data recorded at TFSO corresponding to the three arrays that were operated during the period 1 May 1965 to 31 December 1966. Seismometer locations for the period from 1 May 1965 to 9 December 1966 are shown in figure 3, and short-period seismometer location for the period from 9 December 1966 to 31 December 1966 are shown in figure 4. The following shows the structure of the code used to identify short-period seismographs of the 31-element, crossed-linear, and 19-element arrays:

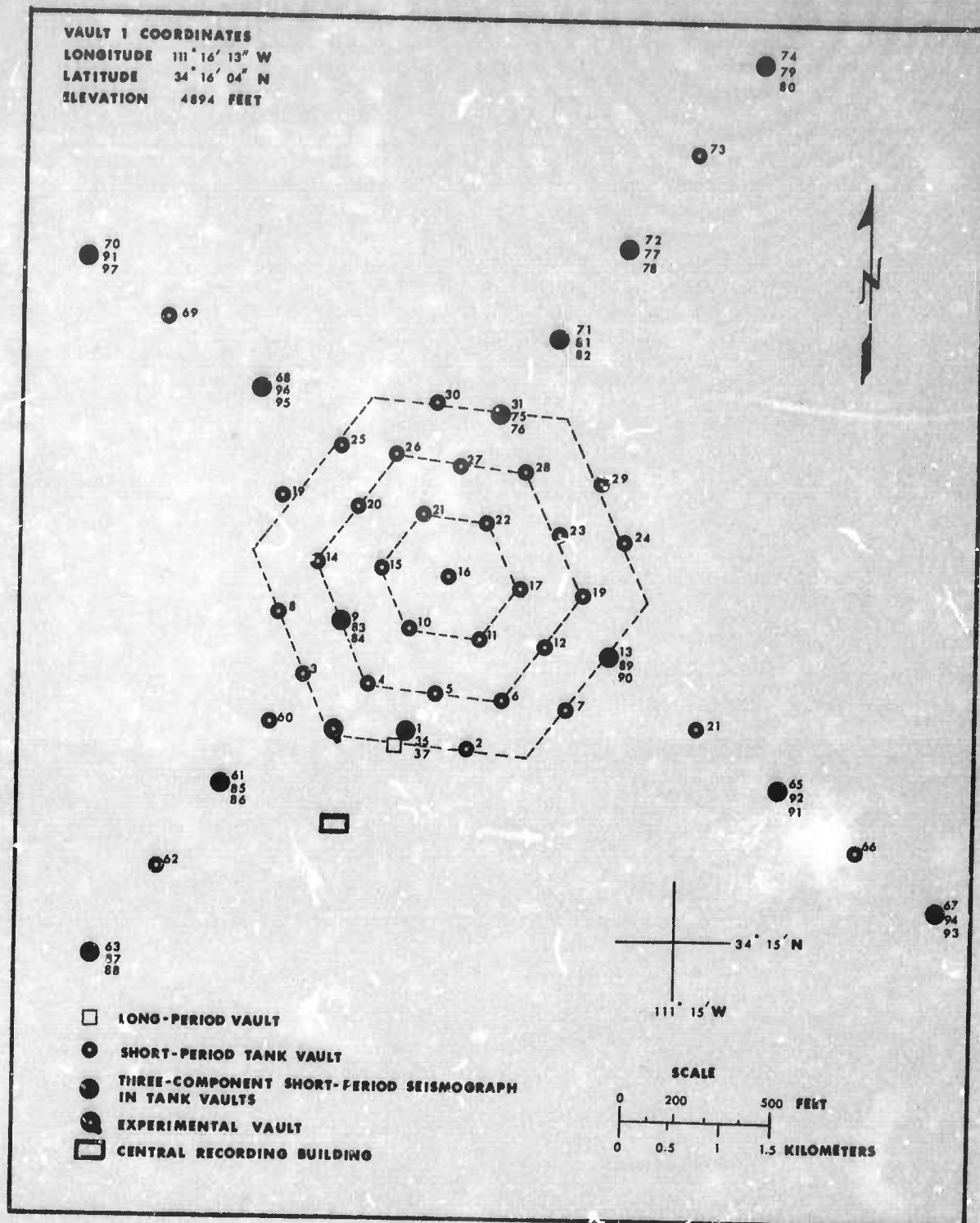


Figure 3. Location of seismometers at TFSO prior to 9 December 1966

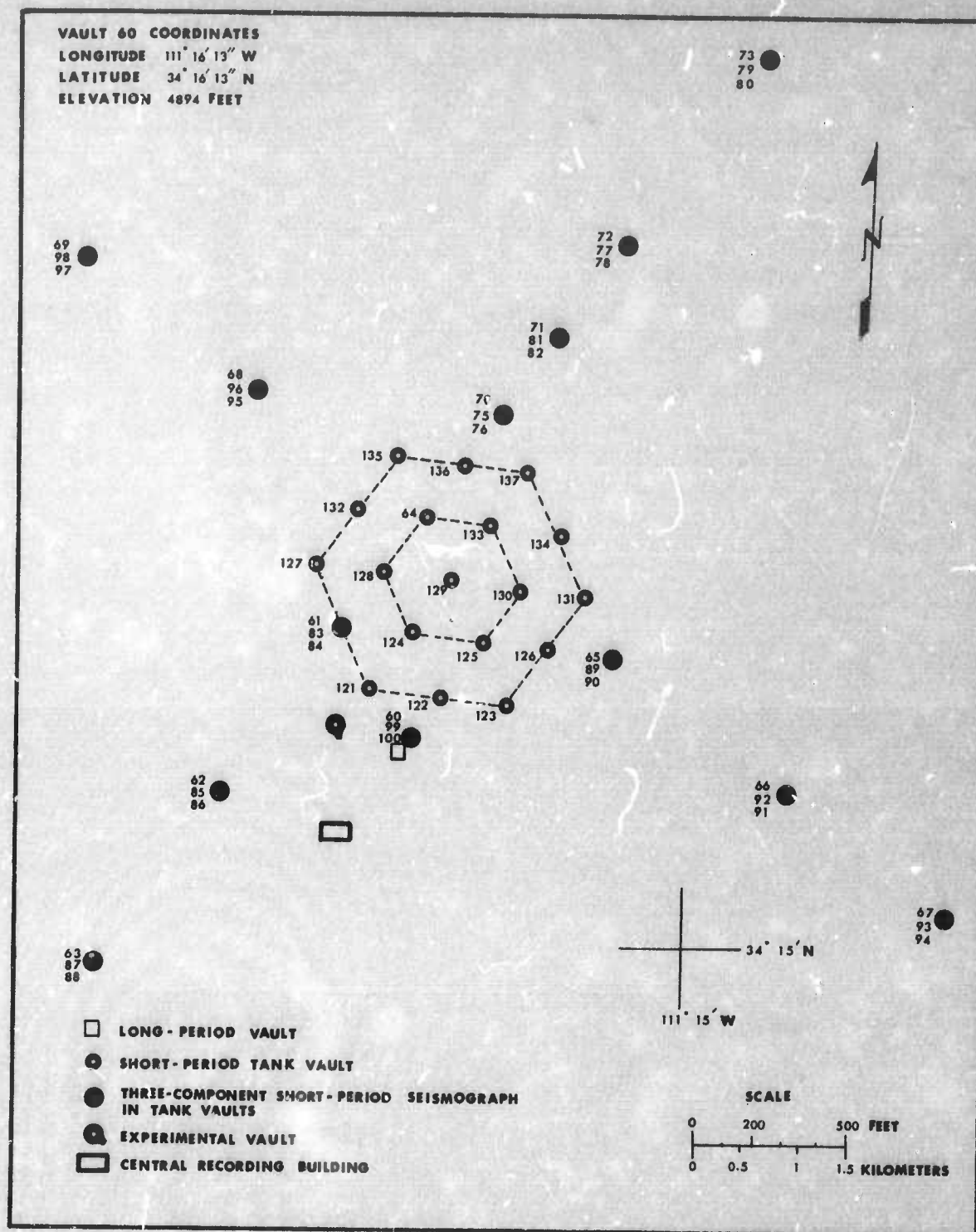


Figure 4. Location of seismometers at TFSO after 9 December 1966

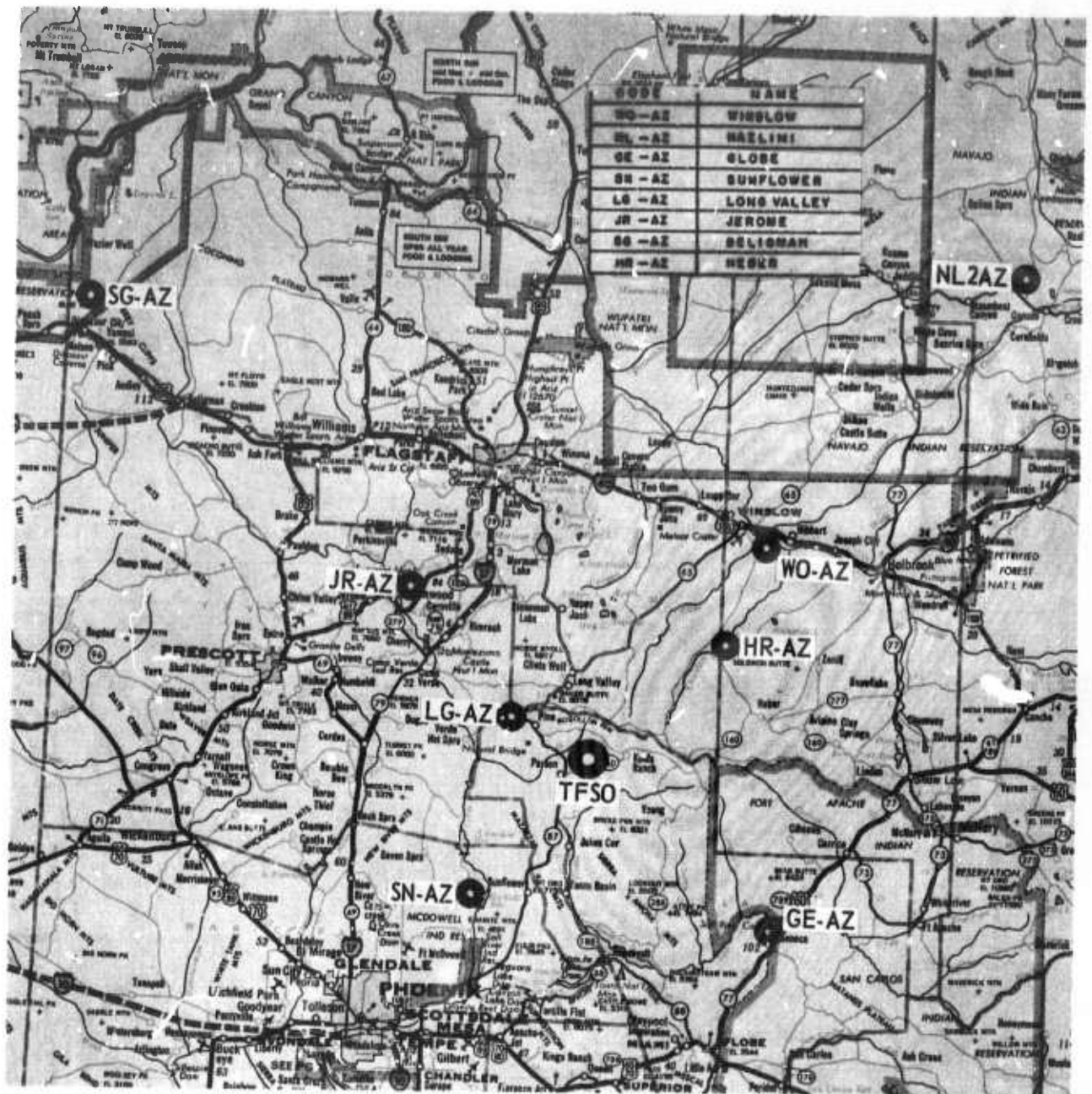


Figure 5. Locations of TFSO and extended array sites

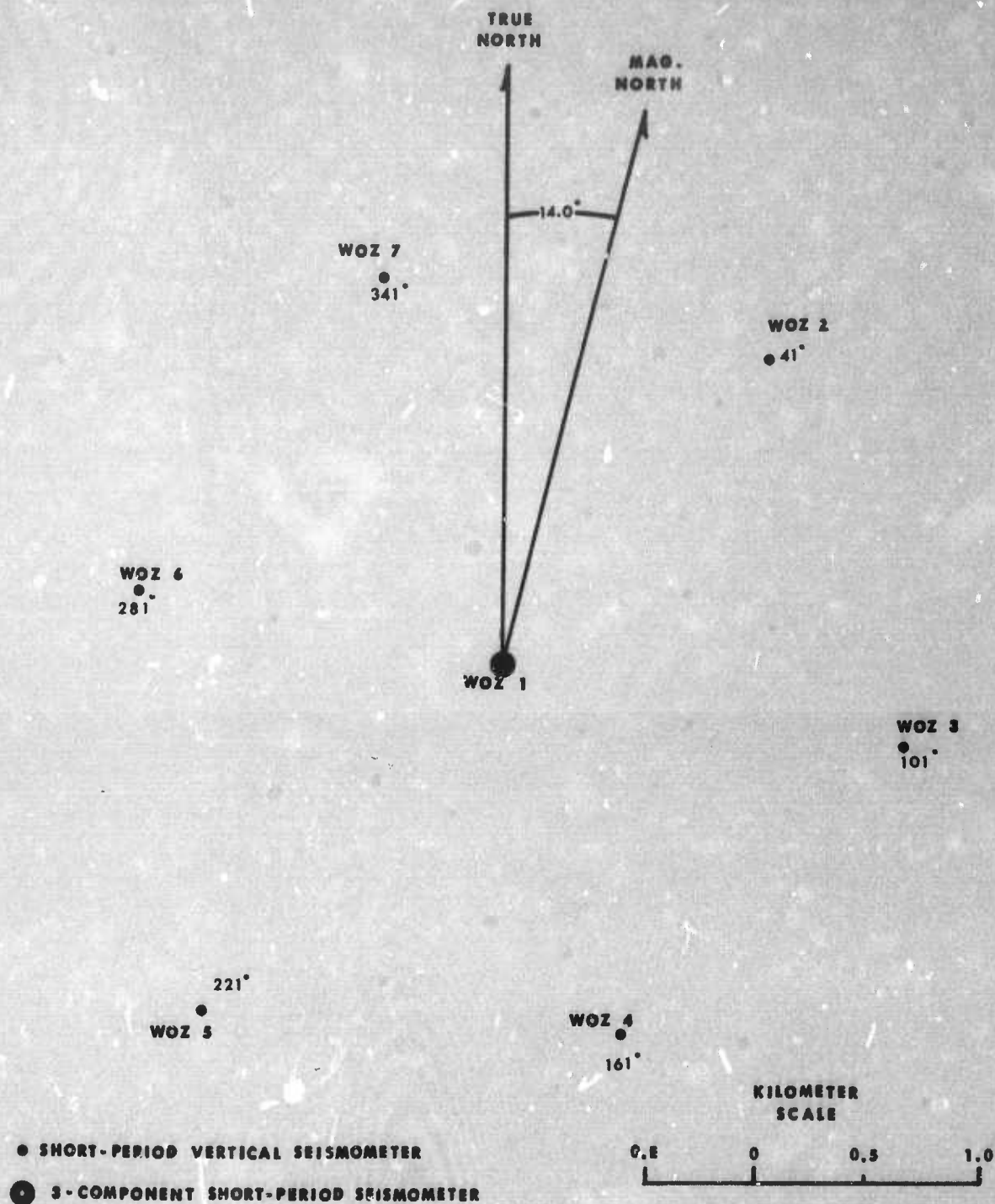


Figure 6. Location of short-period seismometers at Winslow, Arizona LRSM site

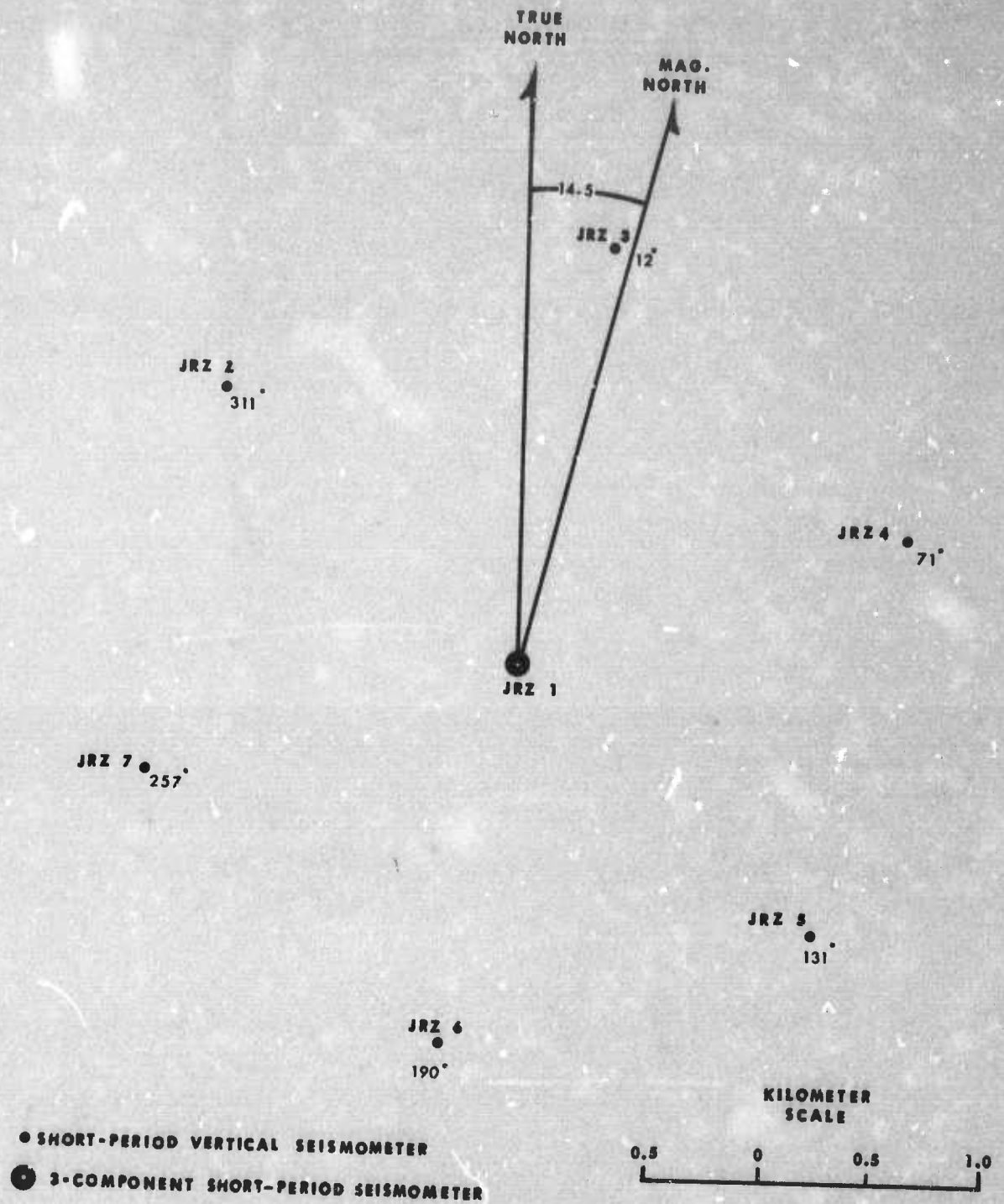


Figure 7. Location of short-period seismometers at Jerome, Arizona LRSM site

Z 33 SL
 Letters denoting relative magnification at which the systems operate. "SL" indicates low-magnification seismograph. The omission of letters indicate a high-magnification seismograph.
 Numeral indicating location of the seismometer in the array at TFSO (see figures 3 and 4).
 Letter designating the component of earth motion sensed by detection axis of the seismometer.

3.2 EXTENDED ARRAY SHORT-PERIOD DATA DESIGNATORS

Data produced by the extended array seismographs were recorded at TFSO from the beginning of Project VT/5055 to 3 October 1965. The abbreviations used to designate the location in the extended array at which instruments were operated by Long Range Seismic Measurements (LRSM) teams follows:

| <u>Abbreviation</u> | <u>LRSM Site</u> | <u>Horizontal Seismometer Orientation</u> | |
|---------------------|----------------------|---|----------|
| | | <u>R</u> | <u>T</u> |
| GE-AZ | Globe, Arizona | 131° | 221° |
| HR-AZ | Heber, Arizona | 131° | 221° |
| JR-AZ | Jerome, Arizona | 131° | 221° |
| LG-AZ | Lone Valley, Arizona | 131° | 221° |
| NL-AZ | Nazline, Arizona | 131° | 221° |
| SG-AZ | Seligman, Arizona | 131° | 221° |
| SN-AZ | Sunflower, Arizona | 131° | 221° |
| WO-AZ | Winslow, Arizona | 131° | 221° |

The following shows the structure of the code used to identify short-period seismographs of the extended array:

were used to identify long-period data produced by the long-period seismograph operated at TFSO.

Table 2. TFSO long-period data designators

| <u>Data Designator</u> | <u>Seismograph Description</u> |
|----------------------------|--|
| Z44LP or GLZ44 | Prior to 22 April 1966, this designator identified a high-gain vertical long-period seismograph operated with an unnotched response. After 22 April 1966, this designator identified a high-gain vertical long-period seismograph with a response notch-filtered at 6 seconds with a Model 6824-15 filter. In both seismographs a Model 7505A seismometer was used. |
| Z44LP(N) or GLZ44(N) | High-gain vertical long-period seismograph with response, notch-filtered at 6 seconds with Filter, Model 6824-15. The vertical component of earth motion was sensed by a Model 7505A seismometer. |
| Z44LL or GLZ44LG | Low-gain long-period vertical seismograph with response, notch-filtered at 6 seconds with a Model 6824-15 filter. The vertical component of earth motion was sensed with a Model 7505A seismometer. |
| Z51LP | High-gain long-period vertical seismograph operated with an unnotched response. The vertical component of earth motion was sensed by a Model 7505A seismometer. |
| E45LP or GLE45 | Prior to 22 April 1966, this designator identified as high-gain long-period horizontal seismograph operated with unnotched response. After 22 April 1966, designator identified a high-gain long-period horizontal seismograph with response notch-filtered at 6 seconds with a Model 6824-15 filter. In both seismographs the east-west component of earth motion was sensed with a Model 8700C seismometer. ² |
| E52LP | A high-gain long-period horizontal seismograph operated with an unnotched response. The east-west component of earth motion was sensed with a Model 8700C seismometer. ² |

²During the period from 17 May 1966 to 2 December 1966, seismometer was oriented north-south for test purposes.

Table 2. TFSO long-period data designators (cont.)

| <u>Data Designator</u> | <u>Seismograph Description</u> |
|------------------------|---|
| E45LL or GLE45LG | A low-gain long-period horizontal seismograph with response notch-filtered at 6 seconds with a Model 6824-15 filter. The east-west component of earth motion was sensed with a Model 8700C seismometer. ³ |
| N46LP or GLN46 | Prior to 22 April 1966, this designator identified a high-gain long-period horizontal seismograph operated with an unnotched response. After 22 April 1966, this designator identified a high-gain long-period horizontal seismograph with response notch-filtered at 6 seconds with a Model 6824-15 filter. In both seismographs, the north-south component of earth motion was sensed with a Model 8700C seismometer. |
| N52LP | High-gain long-period horizontal seismograph operated with an unnotched response. The north-south component of earth motion was sensed with a Model 8700C seismometer. |
| N46LP or GLN46LG | High-gain long-period horizontal seismograph with response notch-filtered at 6 seconds with a Model 6824-15 filter. The north-south component of earth motion sensed with a Model 8700C seismometer. |
| Z52LP | High-gain long-period vertical seismograph operated with an unnotched response. The vertical component of earth motion was sensed by a Sprengnether seismometer. |
| R53LP | High-gain long-period horizontal seismograph operated with an unnotched response. The east-west component of earth motion was sensed by a Sprengnether seismometer. |
| T54LP | High-gain long-period horizontal seismograph operated with an unnotched response. The north-south component of earth motion was sensed by a Sprengnether seismometer. |
| N57LPX | High-gain long-period horizontal seismograph operated with an unnotched response. The north-south component of earth motion was sensed by a modified (wire flexures) Model 8700C seismometer. |

³Ibid

Table 2. TFSO long-period data designators (cont.)

| <u>Data Designator</u> | <u>Seismograph Description</u> |
|------------------------|---|
| N54LPX | High-gain long-period horizontal seismograph with response notch-filtered at 6 seconds with a Model 6824-15 filter. The north-south component of earth motion was sensed by a Model 7505A seismometer installed in a surface vault. |
| Z54LPX | High-gain long-period vertical seismograph with response notch-filtered at 6 seconds with a Model 6824-15 filter. The vertical component of earth motion was sensed by a Model 7505A seismometer installed in a surface vault. |
| Z57LPX | High-gain long-period vertical seismograph operated with an unnotched response. The vertical component of earth motion was sensed by a Model 7505A seismometer installed in a surface vault. |

4.2 TFSO BROAD-BAND DATA DESIGNATORS

Three broad-band seismographs were operated periodically during the period from 1 May 1965 to 31 December 1966. The following table identifies the seismographs operated and the data designators used:

| <u>Data Designator</u> | <u>Seismograph Description</u> |
|------------------------|---|
| Z38BB or BBZ38 | Amplified vertical broad-band seismograph using a vertical Press-Ewing seismometer. |
| N4CBB | Amplified broad-band horizontal seismograph. The north-south component of earth motion was sensed by a Press-Ewing seismometer. |
| E39BB or BBE39 | Amplified broad-band horizontal seismograph. The east-west component of earth motion was sensed by a Press-Ewing seismometer. |

4.3 TFSO INTERMEDIATE-BAND DATA DESIGNATORS

Three, intermediate-band seismographs were operated periodically at TFSO during the period from 1 May 1965 to 31 December 1966. The seismographs are described and the data designators used are given in the following table:

| <u>Data Designator</u> | <u>Seismograph Description</u> |
|------------------------|--|
| IBZ41 or Z41IB | Amplified intermediate-band vertical seismograph using a Lehner-Griffith, vertical seismometer. |
| IBE42 or EIB42 | Amplified intermediate-band horizontal seismograph. The east-west component of earth motion was sensed by Lehner-Griffith seismometer. |
| IBN43 or N43IB | Amplified intermediate-band horizontal seismograph. The north-south component of earth motion was sensed by a Lehner-Griffith seismometer. |

4.4 TFSO HIGH-FREQUENCY DATA DESIGNATORS

Seven high-frequency seismographs were in operation intermittently from 15 September 1965 to 8 July 1966. The seismographs and the data designators used are listed in table 3. The frequency responses with which these seismographs were operated are shown in figures 8 through 11.

Table 3. TFSO high-frequency data designators

| <u>Data Designator</u> | <u>Seismograph Description</u> |
|------------------------|--|
| ZHF1 | Amplified vertical high-frequency seismograph with response peaked at 6 cps. |
| ZHF2 | Amplified vertical high-frequency seismograph with response peaked at 8 cps. |
| ZHF3 | Amplified vertical high-frequency seismograph with response peaked at 6 cps. |

Table 3. TFSO high-frequency data designators (cont.)

| <u>Data Designator</u> | <u>Seismograph Description</u> |
|------------------------|--|
| ZHF4 | Amplified vertical high-frequency seismograph with response peaked at 8 cps. |
| ZHF5 | Amplified vertical high-frequency seismograph with response peaked at 10 cps. |
| ZHF6 | Amplified vertical high-frequency seismograph with response peaked at 10 cps. |
| ΣGF | Amplified vertical high-frequency seismograph comprised of 24 Century Model 12 FL, 12 cps geophones in an 880-foot array. Summed output of geophones amplified with Model 4300 PTA equipped with Model 4100-11 galvanometer. |

4.5 SHALLOW-HOLE SEISMOGRAPH

Two shallow-hole seismographs were operated intermittently at TFSO during the period from 1 May 1965 to 31 December 1966. Following are the designators used to identify these data:

| <u>Data Designator</u> | <u>Seismograph Description</u> |
|------------------------|--|
| Z102SG | Amplified vertical short-period seismograph operated in a shallow hole. The seismograph consisted of a Model 20171 vertical seismometer and a Model 23168-A amplifier. |
| Z103SH | Amplified vertical short-period seismograph operated in a shallow hole. The seismograph consisted of a Hall Sears Model 10-1 vertical seismometer and a Texas Instruments Model RA5 amplifier. |

4.6 TFSO SUMMATION DATA DESIGNATORS

The Greek letter sigma, "Σ," and the word "Sum" were used to indicate data summation. The systems summed and the designators used are listed in table 4.

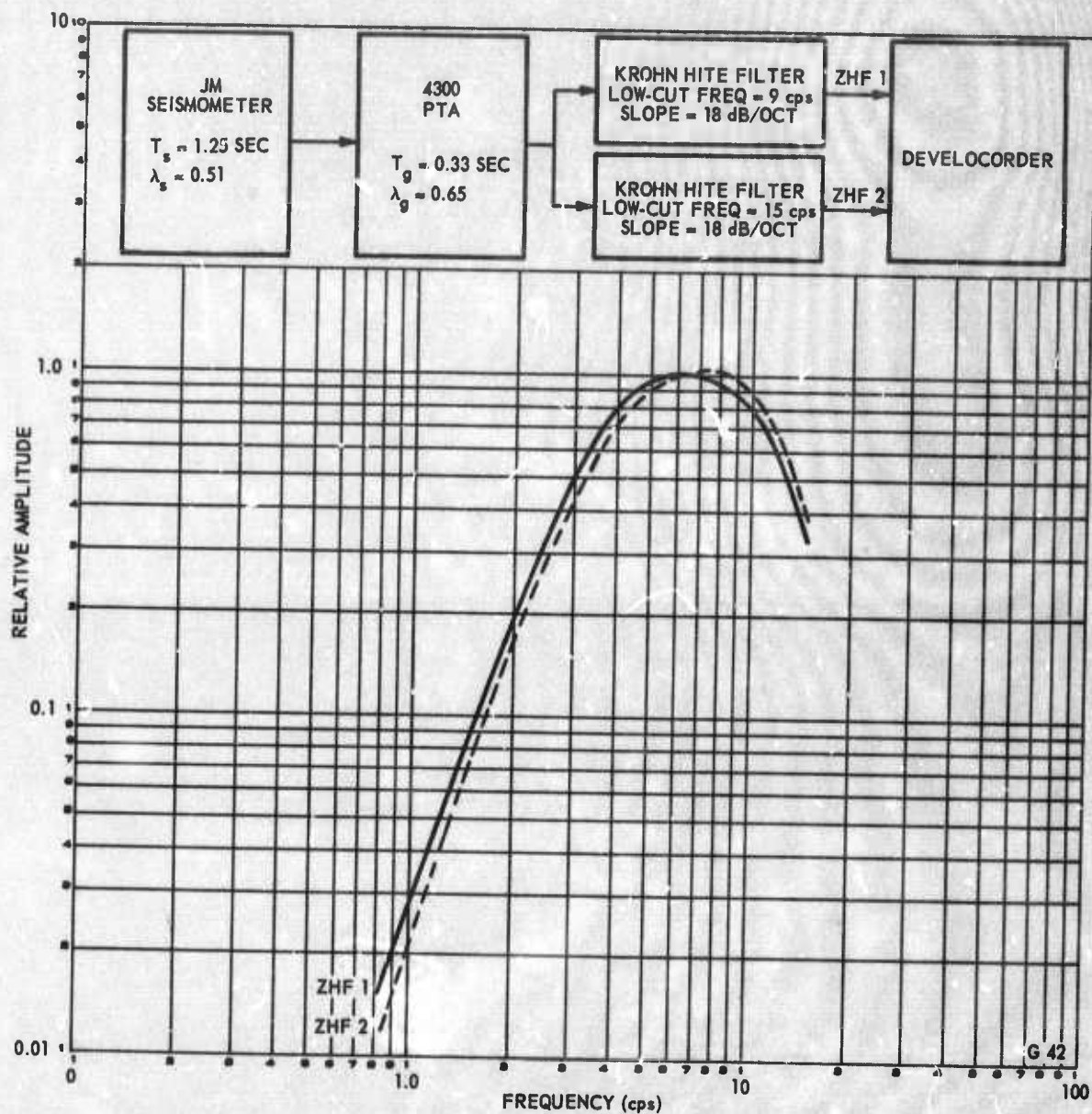


Figure 8. Frequency responses and block diagrams for ZHF1 and ZHF2

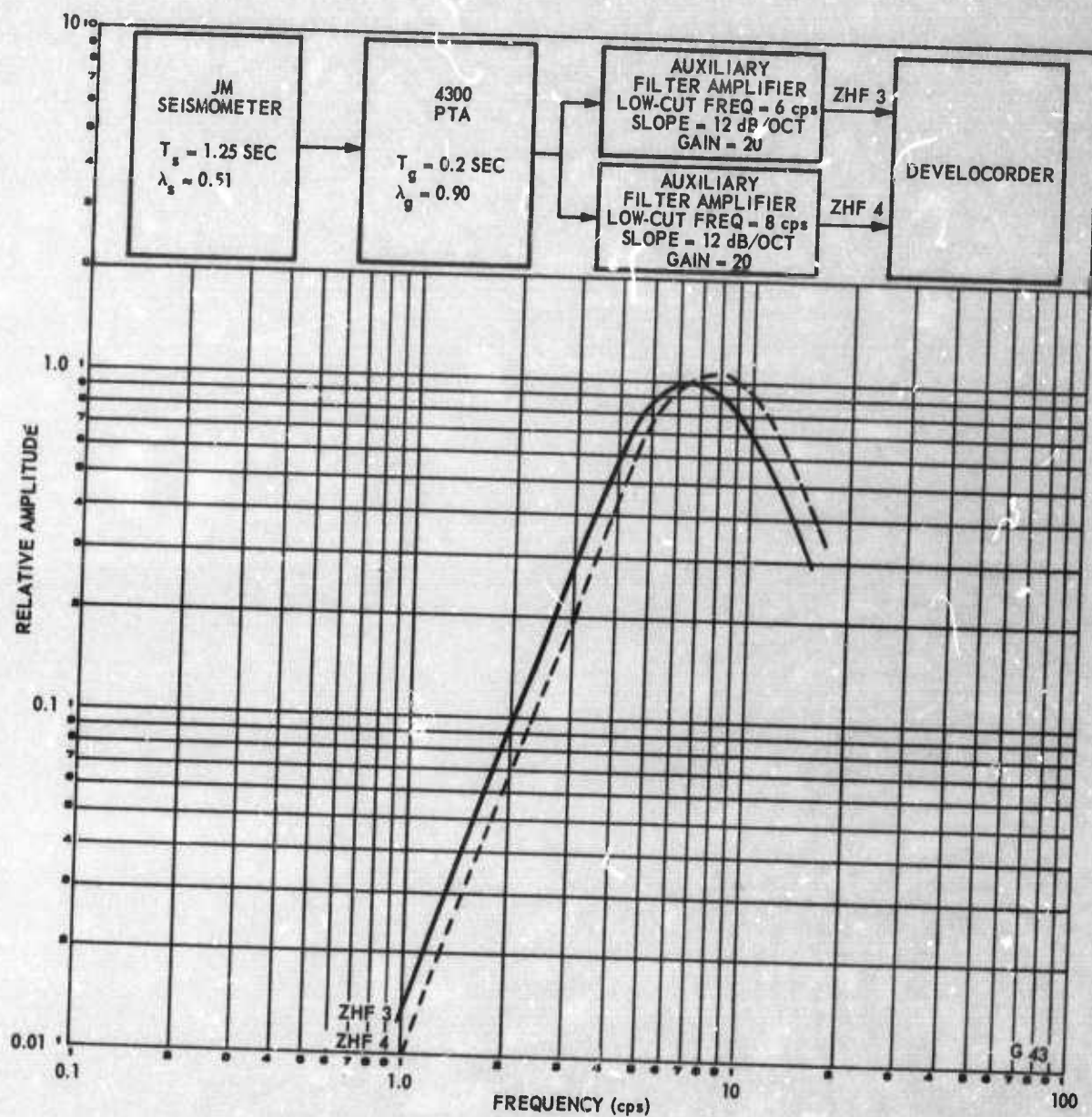


Figure 9. Frequency responses and block diagrams for ZHF3 and ZHF4

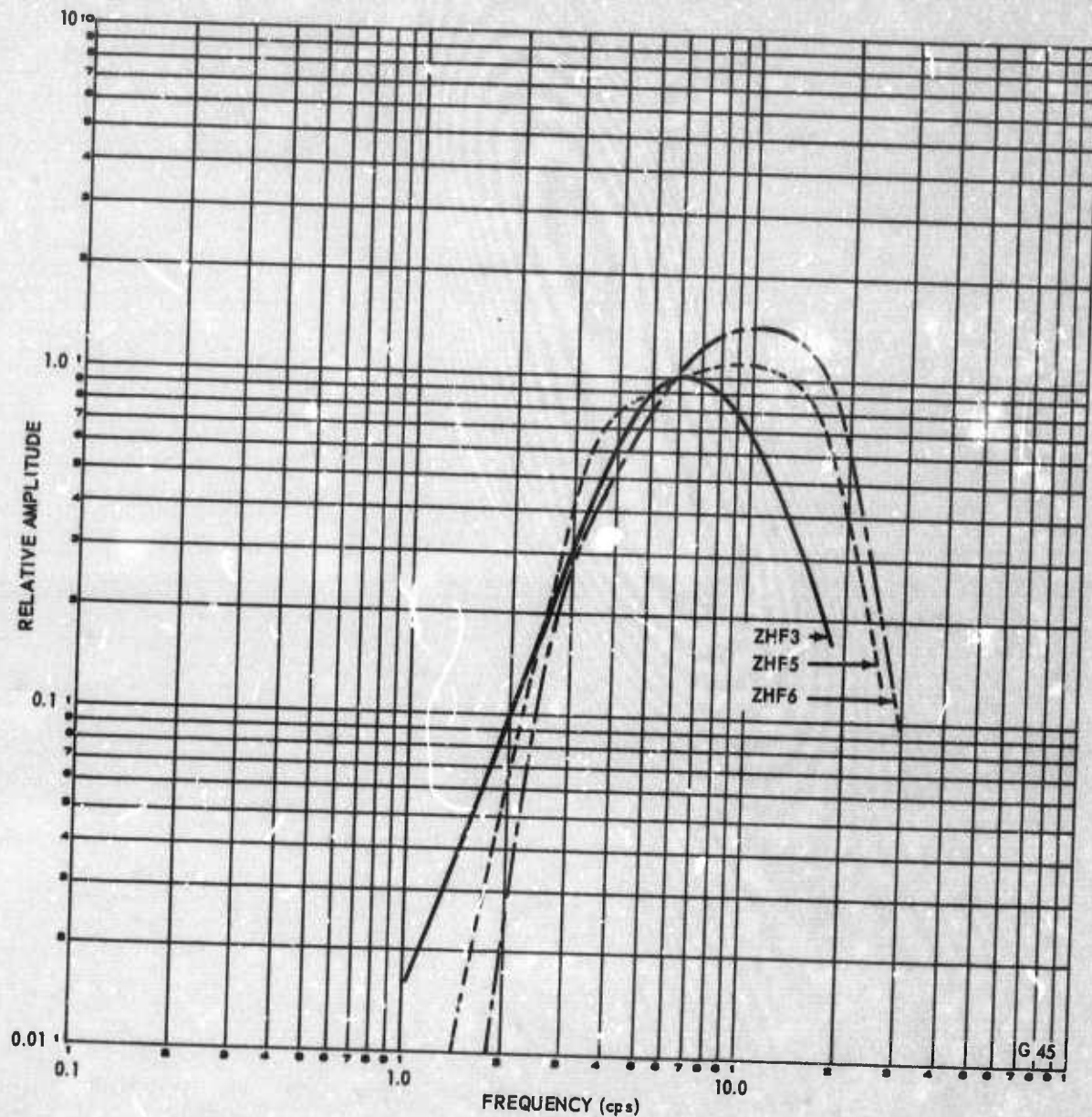


Figure 10. Frequency responses for the high-frequency seismographs (These responses are plotted for constant amplitude input and apply to the film recordings.)

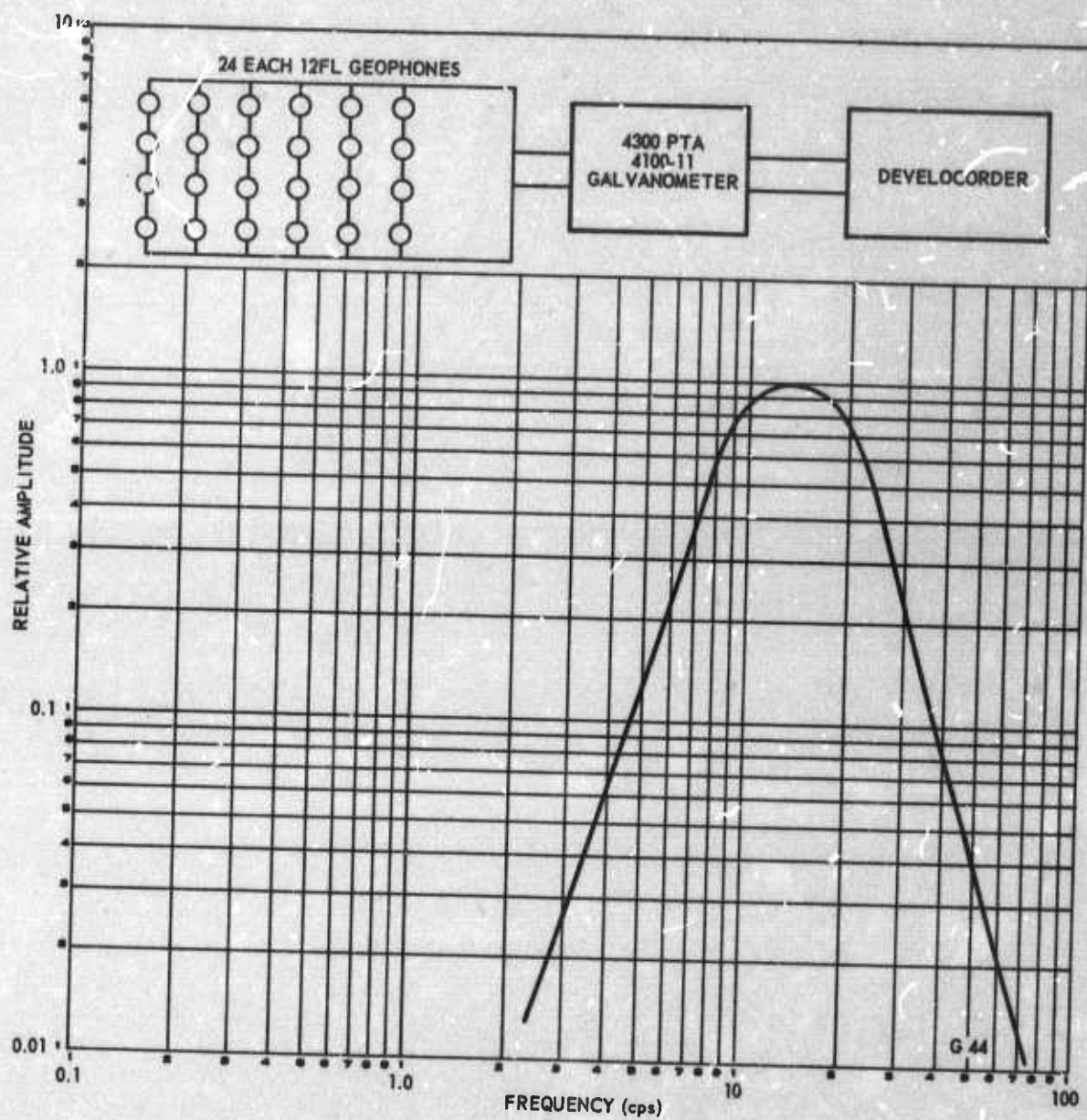


Figure 11. Block diagram and estimated frequency response for the Geophone seismograph (ΣGF)

Table 4. Designation of summed data

| <u>Data Designator</u> | <u>Seismographs Summed</u> |
|--|---|
| $\Sigma A1$ | Z10, Z11, Z15, Z17, Z21, and Z22 |
| ΣB | Z1, Z2, Z3, Z4, Z5, Z6, Z7, Z8, Z9, Z10, Z11, Z12, Z14, Z15, Z16, Z17, Z18, Z19, Z20, Z21, Z22, Z23, Z24, Z25, Z26, Z27, Z28, Z29, Z30, and Z31 |
| $\Sigma B2$ | Z1, Z2, Z3, Z4, Z5, Z6, Z7, Z8, Z9, Z10, Z11, Z12, Z13, Z14, Z15, Z16, Z17, Z18, Z19, Z20, Z21, Z22, Z23, Z24, Z25, Z26, Z27, Z28, Z29, Z30, and Z31 |
| ΣT | Z63, Z62, Z61, Z3, Z9, Z15, Z21, Z27, Z31, Z71, Z72, Z73, Z74, Z67, Z65, Z66, Z64, Z13, Z17, Z25, Z68, Z69, and Z70 |
| ΣTF | Z1, Z2, Z3, Z4, Z5, Z6, Z7, Z8, Z9, Z10, Z11, Z12, Z13, Z14, Z15, Z16, Z17, Z18, Z19, Z20, Z21, Z22, Z23, Z24, Z25, Z26, Z27, Z28, Z29, Z30, and Z31 - Summation seismograph is filtered with a UED filter. |
| ΣTFK | Same as ΣTF except that filtering is accomplished with a Krohn-Hite filter. |
| Sum B | R76, R84, R89, and R95 |
| Sum P(ΣNE) or ΣP | T75, T77, T79, T81, T83, T85, T87, T90, T92, T94, T96, and T98 |
| JR Σ or JR $\Sigma 2-7$ | JRZ2, JRZ3, JRZ4, JRZ5, JRZ6, and JRZ7 |
| WO Σ or WO $\Sigma 2-7$ | WOZ2, WOZ3, WOZ4, WOZ5, WOZ6, and WOZ7 |
| ΣO or Sum O (ΣE) | R76, R78, R80, R82, R84, R86, R88, R89, R91, R93, R95, and R97 |
| ΣC | T75, T83, T90, and T96 |

4.7 TFSO SPECIAL AND EXPERIMENTAL DATA DESIGNATORS

Several seismographs with special characteristics were operated at the observatory. These special seismographs and corresponding data designators are listed in table 5:

Table 5. TFSO special and experimental data designators

| <u>Data Designator</u> | <u>Seismograph System</u> |
|------------------------|--|
| BVF | Earth-powered vertical short-period seismograph. |
| Z102X | Experimental high-gain short-period vertical seismograph consisting of a Model 6480 seismometer equipped with a high impedance coil and a Model 25220 amplifier. |
| ZFX | High-gain short-period vertical seismograph (French seismograph). |
| ZIF | High-gain short-period vertical seismograph. Output of amplifier filtered with a United Electrodynamics Model 25220 filter. Vertical component of earth motion sensed with a Model 6480 seismometer. |
| Z47BF or BFZ47 | High-gain short-period vertical seismograph. |
| BFE48 or E48BF | High-gain short-period horizontal seismograph. East-west component of earth motion sensed by a Model 1101 seismometer. |
| BFN49 or N49BF | High-gain short-period horizontal seismograph. North-south component of earth motion sensed by a Model 1101 seismometer. |

5. SEISMIC DATA RECORDED ON 35-MILLIMETER DRUM RECORDER AT TFSO

Identifiers used for seismic data recorded on 35-millimeter film at TFSO are listed in the following table:

| <u>Data Designator</u> | <u>Seismograph System</u> |
|----------------------------|---|
| IA | Earth-powered short-period vertical seismograph. Vertical component of earth motion sensed by a Model 1051 seismometer. |
| IB | Earth-powered short-period horizontal seismograph. North-south component of earth motion sensed by a Model 1101 seismometer. |
| IC | Earth-powered short-period horizontal seismograph. East-west component of earth motion sensed by a Model 1101 seismometer. |
| ID | Earth-powered short-period horizontal seismograph. East-west component of earth motion sensed by a Wood-Anderson seismometer. |
| IE | Earth-powered short-period horizontal seismograph. North-south component of earth motion sensed by Wood-Anderson seismometer. |

6. PHASE STUDY DATA

A phase study test was conducted at TFSO and at each LRSM site in the extended array. During these tests, the output of the function generator at each site was recorded at TFSO in order to study the phase characteristics of the systems. The designators used to identify these data were as follows:

| <u>Data Designator</u> | <u>Data</u> |
|----------------------------|---------------------------------------|
| TFSO Test | Output of function generator at TFSO; |
| SG Test | Output of function generator at "SG"; |
| JR Test | Output of function generator at "JR"; |
| LG Test | Output of function generator at "LG"; |
| GE Test | Output of function generator at "GE"; |
| SN Test | Output of function generator at "SN"; |
| HR Test | Output of function generator at "HR"; |
| WO Test | Output of function generator at "WO"; |
| NL Test | Output of function generator at "NL." |

7. NON-SEISMIC DATA

Non-seismic data recorded at TFSO consisted of meteorological and chronological data. Designators used to identify these data are listed below:

| <u>Designator</u> | <u>Data</u> |
|-------------------|---|
| TCDMG | Time code data management generator. |
| WWV | Time signal transmitted from National Bureau of Standards, Radio Station WWV. |
| ML | Long-period microbarograph with a pass band from 0.026 to 0.0023 cps. |
| MS | Short-period microbarograph with a pass band from 0.046 to 1.03 cps. |
| WI | Output of wind direction indicator. |
| A | Anemometer. |

8. DATA GROUP NUMBERS

8.1 A listing of data recorded on the Develocorders at TFSO, by data group number, is presented in table 6. Data group numbers for both short-period and long-period Develocorders are presented in the table.

A listing of data recorded on FM magnetic tape, by data group number, is presented in table 7.

8.2 A chronological listing of data group numbers for data recorded on the Develocorders at TFSO is presented in table 8, and a chronological listing of data group numbers for data recorded on FM magnetic tape is presented in table 9.

Table 6. Develocorder data channel assignment at TFSO
from 1 May 1965 to 31 December 1966

[illegible]

| | | Long-Period Developer | | | | | | | | | | | | | |
|--------------|--|--|--|--|--|--|---|--|---|--|--|--|--|---|---|
| Chen. No. | Date Group 7128 1 May 65- 15 July 65 | Date Group 7139 29 May 65- 5 June 65 | Date Group 7139 19 June 65- 26 June 65 | Date Group 7139 1 Sept 65- 5 Sept 65 | Date Group 7140 29 May 65- 5 June 65 | Date Group 7140 19 June 65- 26 June 65 | Date Group 7140 1 Sept 65- 3 Oct 65 | Date Group 7142 26 July 65- 15 July 65 | Date Group 7150 15 July 65- 1 Sept 65 | Date Group 7156 1 Sept 65- 28 Dec 65 | Date Group 7176 28 Dec 65- 22 April 66 | Date Group 7181 22 May 66- 31 Dec 66 | Date Group 7184 28 May 66- 31 Dec 66 | Date Group 7189 16 Aug 66- 9 Dec 66 | Date Group 7199 9 Dec 66- 31 Dec 66 |
| 1 | TCMDG | TCMDG | TCMDG | TCMDG | TCMDG | TCMDG | TCMDG | TCMDG | TCMDG | TCMDG | TCMDG | Z388B | Z388B | TCMDG | TCMDG |
| 2 | BBZ38 | SGLPZ | SGLPZ | SGLPZ | SGLPZ | SGLPZ | SGLPZ | SGLPZ | SGLPZ | Z388B | Z388B | N40BB | N40BB | 470 | 470 |
| 3 | BBE39 | SGLPR | SGLPR | SGLPR | SGLPR | SGLPR | SGLPR | SGLPR | SGLPR | N40BB | N40BB | MS | E398B | 267 | 267 |
| 4 | 8BN40 | SGLPT | SGLPT | SGLPT | SGLPT | SGLPT | SGLPT | SGLPT | SGLPT | E398B | Z388B | ML | ML | 274 | 274 |
| 5 | 1BZ41 | JRLPZ | JRLPZ | JRLPZ | JRLPZ | JRLPZ | JRLPZ | JRLPZ | JRLPZ | 1BZ41 | Z44LP | Z44LP | Z44LP | 263 | 263 |
| 6 | 1BE42 | JRLPR | JRLPR | JRLPR | JRLPR | JRLPR | JRLPR | JRLPR | JRLPR | 1BE42 | N46LP | N46LP | N46LP | 221 | 264 |
| 7 | 1BN43 | JRLPT | JRLPT | JRLPT | JRLPT | JRLPT | JRLPT | JRLPT | JRLPT | 1BN43 | E4SLP | E4SLP | E4SLP | Z47BF | Z47BF |
| 8 | GLZ44(N) | LGLPZ | LGLPZ | LGLPZ | LGLPZ | LGLPZ | LGLPZ | LGLPZ | LGLPZ | GLZ44(N) | N46LP | N46LP | MS | Z49BF | N49BF |
| 9 | GLE45 | LGLPR | LGLPR | LGLPR | LGLPR | LGLPR | LGLPR | LGLPR | LGLPR | GLE45 | E4SLP | E4SLP | Z51LP | E48BF | E48BF |
| 10 | GLN46LG | LGLPT | LGLPT | LGLPT | LGLPT | LGLPT | LGLPT | LGLPT | LGLPT | GLN46 | ML | NS3LP | Z388B | N40BB | N40BB |
| 11 | GLE44 | GELPZ | GELPZ | GELPZ | GELPZ | GELPZ | GELPZ | GELPZ | GELPZ | GLZ44(N) | RS3LP | ES2LP | ES2LP | E398B | E398B |
| 12 | GLZ44(N)LG | GELPR | GELPR | GELPR | GELPR | GELPR | GELPR | GELPR | GELPR | GLZ44LG | Z44LL | Z44LL | Z44LL | N46LP | N46LP |
| 13 | GLE4SLG | GELPT | GELPT | GELPT | GELPT | GELPT | GELPT | GELPT | GELPT | GLE4SLG | N46LL | N46LL | N46LL | Z44LP | Z44LP |
| 14 | GLN46LG | WNV | WNV | WNV | WNV | WNV | WNV | WNV | WNV | GLN46LG | E4SLL | E4SLL | E4SLL | N46LP | N46LP |
| 15 | ML | | | | | | | | | M1 | E4SLL | E4SLL | E4SLL | E4SLL | E4SLL |
| 16 | WNV | | | | | | | | | WNV | WNV | WNV | WNV | WNV | WNV |

1 May 1965 to 31 December 1966

[illegible]

Table 8. Chronological listing of Develocorder
data groups recorded at TFSO

| <u>Date</u> | | <u>Develocorder</u> | | | | | | | | | |
|-------------|------|---------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| | | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | <u>6</u> | <u>7</u> | <u>8</u> | <u>9</u> | <u>10</u> |
| 1 May | 1965 | 7116 | 7128 | 7119 | 7120 | 7040 | 7104 | 7105 | 7090 | 7118 | 7106 |
| 14 May | 1965 | " | " | 7133 | " | " | " | " | " | 7134 | " |
| 29 May | 1965 | " | " | 7139 | 7140 | " | " | " | " | " | " |
| 5 June | 1965 | " | " | 7132 | 7133 | " | " | " | " | " | " |
| 19 June | 1965 | " | " | 7139 | 7140 | " | " | " | " | " | " |
| 26 June | 1965 | " | " | 7141 | 7142 | " | " | " | " | " | " |
| 14 July | 1965 | " | " | " | " | " | " | " | " | " | 7144 |
| 15 July | 1965 | 7149 | 7150 | 7145 | 7133 | " | 7146 | 7147 | " | " | 7148 |
| 26 July | 1965 | " | " | 7153 | 7154 | " | " | " | " | " | 7155 |
| 28 July | 1965 | " | " | 7145 | 7133 | " | " | " | " | " | 7148 |
| 1 Sept. | 1965 | " | 7156 | 7139 | 7140 | " | " | " | " | " | " |
| 3 Sept. | 1965 | " | " | " | " | " | " | " | " | END | " |
| 16 Sept. | 1965 | " | " | " | " | " | " | " | " | 7162 | " |
| 24 Sept. | 1965 | " | " | " | " | " | " | " | " | " | 7163 |
| 3 Oct. | 1965 | " | " | " | END | " | " | " | " | " | " |
| 5 Oct. | 1965 | " | " | 7164 | " | " | " | " | " | " | " |
| 7 Oct. | 1965 | " | " | " | " | " | " | " | " | " | 7166 |
| 20 Oct. | 1965 | " | " | " | " | " | " | " | " | 7167 | " |
| 1 Nov. | 1965 | " | " | " | " | " | " | " | " | 7170 | " |
| 12 Nov. | 1965 | " | " | " | " | " | " | " | " | 7172 | " |
| 18 Nov. | 1965 | " | " | " | " | " | " | " | " | " | 7173 |
| 28 Dec. | 1965 | " | 7171 | " | " | " | " | " | " | " | 7177 |
| 21 Jan. | 1966 | " | " | " | " | " | " | " | " | 7178 | " |
| 1 Feb. | 1966 | 7179 | " | " | " | " | " | " | " | " | 7180 |
| 22 Apr. | 1966 | " | 7181 | " | " | " | " | " | " | " | " |
| 11 May | 1966 | " | " | " | " | " | " | " | " | 7182 | " |
| 20 May | 1966 | " | 7184 | " | " | " | " | " | " | 7183 | 7185 |
| 8 July | 1966 | " | " | END | " | " | " | " | " | " | " |
| 14 July | 1966 | " | " | " | " | " | 7186 | " | 7187 | " | " |
| 16 Aug. | 1966 | " | " | 7189 | " | " | " | " | " | " | 7188 |
| 24 Sept. | 1966 | " | " | " | " | " | " | " | " | 7190 | " |
| 24 Nov. | 1966 | " | " | " | " | " | " | " | " | 7194 | 7192 |
| 9 Dec. | 1966 | 7198 | " | 7199 | " | 7200 | 7201 | 7202 | END | 7203 | 7204 |

Table 9. Chronological listing of magnetic tape data groups recorded at TFSO

| <u>Date</u> | <u>Magnetic Tape Recorder</u> | | | | | |
|--------------|-------------------------------|----------|----------|----------|----------|----------|
| | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | <u>6</u> |
| 1 May 1965 | 7110 | 7112 | 7063 | 7129 | 7127 | 7122 |
| 4 May 1965 | 7107 | " | " | 7108 | " | " |
| 25 May 1965 | 7135 | " | " | 7136 | " | " |
| 28 May 1965 | 7137 | " | " | 7138 | " | " |
| 5 June 1965 | 7135 | " | " | 7136 | " | " |
| 19 June 1965 | 7137 | " | " | 7138 | " | " |
| 26 June 1965 | 7135 | " | " | 7136 | " | " |
| 14 July 1965 | " | " | " | " | " | 7143 |
| 15 July 1965 | " | " | " | " | " | 7131 |
| 26 July 1965 | 7152 | " | " | 7151 | " | " |
| 28 July 1965 | 7148 | " | " | 7135 | " | " |
| 1 Sept. 1965 | 7157 | " | " | 7158 | 7159 | 7160 |
| 3 Sept. 1965 | " | " | 7161 | " | " | " |
| 3 Oct. 1965 | " | " | " | " | " | END |
| 5 Oct. 1965 | 7065 | " | " | 7064 | 7063 | " |
| 7 Oct. 1965 | " | " | " | " | " | 7169 |
| 20 Oct. 1965 | " | " | " | " | " | " |
| 21 Oct. 1965 | " | " | 7168 | " | " | " |
| 23 Oct. 1965 | " | " | " | " | " | " |
| 2 Nov. 1965 | " | " | 7171 | " | " | " |
| 9 Dec. 1965 | " | " | 7174 | " | " | " |
| 23 Dec. 1965 | " | " | 7175 | " | " | " |
| 8 July 1966 | " | " | END | " | " | " |
| 17 Nov. 1966 | " | " | " | " | " | 7191 |
| 24 Nov. 1966 | " | 7193 | " | " | " | " |
| 9 Dec. 1966 | " | 7195 | " | " | 7196 | 7197 |

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13. ABSTRACT

This report outlines the designators used to identify the seismic and meteorological data recorded at the Tonto Forest Seismological Observatory under Project VT/5055 during the period from 1 May 1965 to 31 December 1966.

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14.

KEY WORDS

LINK A

LINK B

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TFSO Data Designators
TFSO Data Group Numbers
Seismograph Response Characteristics
TFSO Seismometer Locations
TFSO Extended Array Site Locations
TFSO Seismograph Operating Parameters
and Tolerances

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